CLAIMS

WHAT IS CLAIMED:

1. A light modulating reflective cell comprising a polymer-free chiral nematic liquid crystalline light modulating material, including nematic liquid crystal having positive dielectric anisotropy and chiral material in an amount effective to form focal conic and twisted planar textures, said chiral material having a pitch length effective to reflect light in the visible spectrum, wherein said focal conic and twisted planar textures are stable in the absence of a field and the liquid crystal material is capable of changing textures upon the application of a field.

2. The cell as claimed in Claim 1 wherein the pitch length of the chiral nematic liquid crystal is in a range of from about .25 to about 1.5 microns.

3. The cell as claimed in Claim 1 wherein the pitch length of the chiral nematic liquid crystal is in a range of from about .45 to about .8 microns.

4. The cell as claimed in Claim 1 wherein the nematic liquid crystal has a positive dielectric anisotropy of at least about 5.

5. The cell as claimed in Claim 1 wherein the nematic liquid crystal has a positive dielectric anisotropy of at least about 10.

6. The cell as claimed in Claim 1 wherein the chiral nematic liquid crystal contains from about 20 to about 60% by weight chiral material based on the combined weight of nematic liquid crystal and chiral material.

7. The cell as claimed in Claim 1 wherein the chiral nematic liquid crystal contains from about 20 to about 40% by weight chiral material based on the combined weight of nematic liquid crystal and chiral material.

8. The cell as claimed in Claim 1 wherein the liquid crystal exhibits a stable light reflecting twisted planar structure in a field-OFF condition following removal of a high field-ON condition, and a stable light scattering focal conic texture in a field-OFF condition following removal of a low field-ON condition.

9. A method of addressing a light modulating cell comprising a polymer free chiral nematic liquid crystalline light modulating material, including nematic liquid crystal having positive dielectric anisotropy and chiral material in an amount effective to form focal conic and twisted planar textures, said chiral material having a pitch length effective to reflect light in the visible spectrum, said liquid crystal material being capable of being switched between a stable color reflecting state that reflects a maximum reference intensity and a stable light scattering state exhibiting a minimum reference intensity of reflection by application of a voltage pulse, the method comprising the steps of applying voltage pulses of varying magnitude sufficient to achieve a continuum of stable states having color reflectivity of an intensity between said maximum and minimum reference intensities.

10. The improvement according to claim 9 comprising applying square A.C. voltage pulses.

11. The improvement according to claim 9 comprising applying said A.C. pulses at a magnitude between that which will switch said material from said reflecting state to said scattering state.

12. A method of selectively adjusting the intensity of reflection of colored light from a polymer free chiral nematic liquid crystalline light modulating material, including nematic liquid crystal having positive dielectric anisotropy and chiral material in an amount effective to form focal conic and twisted planar textures, said chiral material having a pitch length effective to reflect light in the visible spectrum, said liquid crystal material being capable of

changing textures upon the application of a field, between a maximum and a minimum intensity, the method comprising subjecting said material to an electric field pulse of sufficient duration and voltage to cause a first proportion of said chiral nematic material to exhibit a first optical state and a second proportion of said chiral nematic material to exhibit a second optical state, whereby said material will continuously reflect a selected intensity between said maximum and minimum that is proportional to the amount of said material in said first optical state.

13. The method according to claim 12 wherein said chiral nematic material in said first optical state exhibits a planar texture and said chiral nematic material in said second optical state exhibits a focal conic texture.

14. A light modulating device comprising liquid crystalline light modulating material of chiral nematic liquid crystal consisting essentially of nematic liquid crystal having positive dielectric anisotropy and chiral material in an amount effective to form focal conic and twisted planar textures having a pitch length effective to reflect light in the visible spectrum, wherein said focal conic and twisted planar textures are stabilized in the absence of a field and the liquid crystal material is capable of changing textures upon the application of a field, wherein a first proportion of said material is in a first optical state and second proportion of said material is in a second optical state, and means for establishing an electrical field through said material, said means adapted to provide a pulse of sufficient voltage and duration to change the proportion of said material in said first optical state, whereby the intensity of light reflected may be selectively adjusted.

15. The device according to claim 14 wherein the material in said first optical state exhibits a planar texture and the material in said second optical state exhibits a focal conic texture.

16. The device according to claim 14 including cell wall structure treated to align the liquid crystal.

17. The device according to claim 14, wherein said means for establishing a field through said material is adapted to provide an AC pulse.